TEACHING EMERGENCY PHONE NUMBERS TO YOUTH WITH DEVELOPMENTAL DISABILITIES

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The purpose of the present study was to investigate the acquisition, maintenance, and generalization effects of antecedent prompt and testing procedure (APTP) on teaching emergency phone numbers to youth with developmental disabilities. Three youths with mental retardation participated in the study. All participants were inclusion students at a regular school. A multiple probe design across behaviors with probe conditions was used in the study. Maintenance (i.e., one and three weeks after the termination of the intervention) and generalization across trainers probe sessions were conducted. Parents' opinions regarding teaching emergency phone . numbers to their children were also included in the study The findings showed that APTP was effective teaching emergency phone numbers to youths with mental retardation at acquisition, maintenance, and generalization levels. Furthermore, the social validity results of the study were very positive in general.

Youth with developmental disabilities come across many threats in their daily lives. Families and professionals feel anxious about the risk their children's face. Hence, there is no doubt about the necessity of teaching specific skills which facilitates and/or ensures the safety of the youth with disabilities. The teaching of safety skills is critical as youth with developmental disabilities step into adulthood. Community safety requires a wide variety of skills including recognizing and avoiding dangerous situation, crossing streets safely, knowing how to speak when needed, and making an emergency phone call in dangerous situations (Bambara, Browder, & Koger, 2006).

Slaton, Schuster, Collins, & Carnine (1994) utilized the term *functional* to describe skills that (a) are immediately useful, (b) are required in a variety of settings such as school, vocational settings, and/or home, (c) promote independence, and (d) encourage youth with disabilities to participate in natural environments

There is considerable research investigating the effects of teaching safety and emergency skills to children and youth with developmental disabilities such as crossing a street (Batu, Ergenekon, Erbas, & Akmanoglu, 2004; Horner, Jones, & Williams, 1985), safety skills that are necessary during a fire (Rae & Roll, 1985), first-aid skills (Gast & Winterling, 1992), food preparation skills and using electronic tools that are commonly used at home (Lalli & Browder, 1993), functional sight words in community-based recreational settings (Schloss & Alper, 1995), and reading product warning labels (Collins & Griffen, 1996). The results of the above studies can be summarized as follows: Children and youth with developmental disabilities were able to learn these safety skills and generalized the acquired skills across different situations. When the instructional procedures of these studies are examined, it is seen that response prompting procedures, especially time delay procedure, are commonly used.

Literature has shown that response prompting strategies are effective on teaching various functional academic skills. Antecedent prompt and testing procedure (APTP) is one of the response prompting strategies. APTP has been successfully used to teach discrete as well as chained skills to children with developmental disabilities (Tekin-Iftar & Kircaali-Iftar, 2006). The review of the literature on APTP indicated that there is a limited number of studies which examine the effectiveness of the procedure. Therefore, further research studies are needed to investigate the effects of APTP on teaching various skills to children with developmental disabilities.

Sarber, Halasz, Messmer, Bicket, & Lutzker (1983) examined the effects of APTP on teaching nutritious menu preparation skills, and purchasing skills to a woman with mild mental retardation. The findings of the study reported that the participant learned to prepare nutritious menus and use appropriate purchasing skills.

Ersoy, Tekin-Iftar, & Kircaali-Iftar (2005) designed a study to analyze the acquisition, generalization, and maintenance effects of APTP on teaching changing sanitary napkins on a doll to three young females with developmental disabilities. Results showed that participants of the study were able to acquire and maintain the skills and to generalize the acquired skills to novel situations. Furthermore, social validity based on the parents' opinions was examined in the study and the results were positive in general.

In other studies, the effectiveness of APTP was analyzed on teaching labeling pictures (Rowan & Pear, 1985), riding on a bus (Welch, Nietupski, & Hamre-Nietupski, 1985), and sex-related skills (Shapiro & Sheridan, 1985).

A comparison study was conducted by Singleton, Schuster, Morse, & Collins (1999) to compare the effectiveness and efficiency of APTP and simultaneous prompting procedure (known as a systematic form of APTP) on teaching grocery sight words to four adolescents with moderate mental retardation. Results of the study indicated that both procedures were effective for teaching the target sight words to the participants. However, APTP was more efficient on measures of acquisition whereas simultaneous prompting was more efficient on maintenance and generalization.

Thus, the effects of the APTP procedure has been investigated in a limited number of instances. The teaching of emergency phone numbers as a community safety skill can be considered as an important safety skill since, youth with developmental disabilities may face various threatening situation, that put them in jeopardy at home or in other settings.

The purpose the present investigation was to find out the effects of APTP on teaching emergency phone numbers to youth with developmental disabilities. Furthermore, parents' opinions regarding teaching emergency phone numbers to their children were examined in the study. This study was designed to answer the following research questions: (1) Does using APTP on teaching emergency phone numbers to youth with developmental disabilities result in (a) acquisition of the target skills, (b) maintenance of the acquired skills one and three weeks after the termination of the intervention, (c) generalization of the acquired skills across persons (2) What are the parents' opinions (social validity) about the aims, procedures, and results of the study?

Method

Participants and Settings

Three children/adolescents with developmental disabilities were the participants of the study. All of the participants were attending the Developmental Disabilities Unit of the Research Institute for the Handicapped at Anadolu University in Eskisehir Turkey for receiving support services for three years. Support services (two hours per week) were provided on one to one basis to teach various academic and social skills. None of the participants had any experience with any response prompting strategies. Parents of the participants were informed about this project and asked to rank the possible target behaviors that their children needed to learn. Parents gave highest ranking to teaching emergency phone numbers.

Ercan was a 13 years old male student with mental retardation. He was diagnosed at the local Guidance and Research Center. He had an IQ of 70 as measured by Stanford Binet and Wechsler. He was an inclusion student at a public school. He had age-appropriate self-care skills, fine and gross motor s, daily living , and basic reading and writing skills. His main weaknesses were in social skills, communication and leisure, and independent living skills.

Ersin was a 12 years old male student with mental retardation. He was diagnosed at the same Guidance and Research Center. He had an IQ of 69 as measured by Stanford Binet. He was an inclusion student at a public school. Like his peer Ercan, Ersin had age-appropriate self-care skills, fine and gross motor skills, and daily living skills. He had basic reading and writing skills as well. His main weaknesses were in social, communication, and independent living skills.

Gaye was a 12 years old female student with mental retardation. She was an inclusion student at a public school. She had age-appropriate self-care skills, fine and gross motor skills, and daily living skills. Her reading and writing skills were at introductory level. Her main weaknesses were in social skils, communication, independent living skills, and community-based skills.

The participants needed the following prerequisite skills for this study: (a) reading and writing at basic level (Grade 2-3 level), (b) following two-step verbal instructions, (c) telling his/her home phone number, (d) selecting reinforcers for himself/herself, and (e) reading three-digit numbers. Reading and writing skills were examined through reviewing school records as well as interviewing the classroom teachers. Following two-steps verbal instructions were assessed by delivering simple instructions such as *Open the door*; *Sit down*. etc. Telling their home phone number was tested by asking for it (e.g., *Ercan, could you please tell your phone number?*). Reinforcer selection skills were tested by asking their preferences. The skill of reading three-digit numbers was assessed by asking the participants to read the three-digit numbers written on a flash card. Correct reading on 10 out of 15 trials was the criterion for this skill.

All experimental sessions were conducted in a classroom at the unit by the researcher. The researcher holds a doctoral degree in special education and had 15 years of experience in teaching students with developmental disabilities at the time the study had been conducted. There were two sets of tables, and chairs for the students and teacher. The teacher had a coffee table for placing the instructional materials. The teacher and participants sat face to face. There were a bookshelf, computer, blackboard in the classroom as well. All sessions were videotaped and were conducted between 2:30 pm and 3:30 pm. with the teacher and participants present. Three sessions were conducted per week for each student.

Materials

Twenty cm x 20 cm laminated flash cards were used in the study. Each flash card had an emergency phone number written by 24 points in Times New Roman and a picture showing the corresponding emergency event. The pictures for the related emergency phone numbers were selected from the 2nd grade Life Sciences book. The pictures were colored by the researcher to make them more attractive for the participants.

Tangible and social reinforcers were used in the study. Stationery items, souvenirs of the favorite football teams, accessories and music tapes were used as tangible reinforcers. Data collection forms, a handycam camera, and edible reinforcers were also used in the study.

Screening Procedures

Prior to initial baseline conditions, the researcher selected 49 emergency phone numbers from the phone directory and a list at the post office. The possible emergency phone numbers to be taught in the study were selected based on the criteria of being functional in daily lives of the participants. Fifteen emergency phone numbers were identified as possible target stimuli by asking parents. The researcher conducted screening sessions as follows: The researcher secured the subjects' attention and presented a candidate target stimulus by asking *Ercan, please tell me the number for the Fire Department.* and waited for 4 s for a response. There were three trials for each candidate target stimulus during screening sessions and three screening sessions were conducted for each student daily. The researcher did not provide any behavioral consequences for the responses. In other words, all responses were ignored. Nine unknown emergency phone numbers were determined for each student and three training sets were presented for each student via these numbers. Training sets for each student are listed in Table 1 on the next page.

Experimental Design

A multiple probe design across training sets and replicated across students was used to assess the effectiveness of APTP on teaching emergency phone numbers to three individuals with developmental disabilities. The dependent variable of the study was the percentage of correct responses and the independent variable of the study was the APTP procedure. The independent variable was introduced to one training set at a time. Experimental control was demonstrated when the student was responding at or near to zero levels during full probe conditions before the intervention had been introduced and then reached criterion only after the intervention was introduced (Tawney & Gast, 1984; Wolery, Bailey, & Sugai, 1988).

Table 1
Tarining sets for each student

Students	Tarining Sets	Emergency Phone Numbers
Ercan	1	Police department (155)
		Fire Department (110)
		Unknown numbers (118)
	2	Water Breakdown (185)
		Medical Emergency (112)
		Electricity Breakdown (186)
	3	Phone Breakdown (121)
		Natural Gas Breakdown (187)
		Radio-TV Breakdown (125)
Ersin	1	Police department (155)
		Fire Department (110)
		Unknown numbers (118)
		Water Breakdown (185)
	2	Medical Emergency (112)
		Electricity Breakdown (186)
	3	Phone Breakdown (121)
		Natural Gas Breakdown (187)
		Radio-TV Breakdown (125
Gaye	1	Police department (155)
		Fire Department (110)
		Unknown numbers (118)
	2	Water Breakdown (185)
		Medical Emergency (112)
		Electricity Breakdown (186)
	3	Phone Breakdown (121)
		Natural Gas Breakdown (187)
		Radio-TV Breakdown (125)

General Procedures

All experimental sessions were conducted in a 1:1 instructional format. A total of nine emergency phone numbers were taught in the study. A full probe condition across training sets was conducted before the instruction of each training set and after criterion was reached for each set. A minimum of three consecutive full probe sessions were conducted in each full probe condition. One training session was conducted per day and one daily probe session was conducted 30 min after the training session. Each emergency phone number was asked three times. Thus, nine trials were delivered for each student during all experimental sessions. Four second response interval was used in the study.

Probe Sessions

Baseline/Full Probe Sessions

A full probe condition across training sets was conducted before the instruction of each training set and after criterion was reached for each set. A minimum of three consecutive full probe sessions were conducted in each full probe condition. Each full probe session was conducted as follows: The teacher had the materials ready, delivered the attentional cue to the student (e.g., Ersin, are you ready to work with me?) and, after receiving an affirmative response, the teacher presented the target stimulus, and asked the task direction (e.g., Ersin, can you tell the phone number for the police department?) and waited 4 s for a student response. Correct responses within 4 s (e.g., It is 155.) resulted in verbal praise (e.g., Very good, 155 is the phone number for the police department.). Incorrect responses or no responses within response interval were ignored, and the teacher presented the next trial. Students' attention and their cooperation behaviors were reinforced verbally at the end of each session (e.g., Very good Ersin. You were very attentive and cooperative with me today.).

Daily Probe Sessions

Daily probe sessions were conducted since a controlling prompt was always presented in each training trial. Following each training session, a daily probe session was conducted. Daily probe sessions were conducted just like full probe sessions with two exceptions. First, only the training set that was currently being taught was assessed in the daily probe sessions instead of all training sets. Second, tangible reinforcers were delivered during daily probe sessions instead of social reinforcement in order to deliver differential reinforcement to increase the number of correct responses.

APTP Intervention Sessions

Intervention sessions consisted of two steps. First prompting sessions where APTP, were delivered and after a while (30 min) probe sessions (daily probe sessions) were conducted to test the acquisition. Daily probe sessions were conducted since a controlling prompt was always presented in each training trial. APTP was introduced during training sessions. After getting stable data during the first full probe condition (baseline condition), the teacher started to teach the first training set composed of emergency numbers. Each student was taught one training set at a time. One training session was conducted three times per week. Training sessions were conducted as follows: The teacher had the materials ready, and delivered the attentional cue to the student (e.g., Ersin, are you ready to work with me?) and, after receiving an affirmative response, the teacher presented the target stimulus, asked the task direction (e.g., Ersin, can you tell the phone number for the police department?), and provided the prompt (the teacher showed the flash card and provided a verbal prompt: Ersin, the phone number for the police department is 155) and waited 4 s for a student response. Correct responses within 4 s (e.g., It is 155.) resulted with verbal praise (e.g., Very good, 155 is the phone number of the police department.). Incorrect responses or no responses within the response interval were ignored, and the teacher presented the next trial. Students' attention and their cooperation behaviors were reinforced verbally at the end of each session (e.g., Very good Ersin. You were very attentive and cooperative with me today.).

Maintenance and Generalization Probe Sessions

Maintenance sessions were conducted one and three weeks after the final full probe condition. Maintenance sessions were identical to the full probe sessions. Reinforcement was thinned by providing the reinforcer only at the end of the sessions during the maintenance sessions.

Generalization across persons was conducted in a pretest-posttest format. Generalization probe sessions occurred in the same way with full probe sessions except these sessions were conducted by other teachers.

Interobserver and Procedural Reliability

Reliability data were collected during 20 % of the experimental sessions (20 % of full probe sessions, 20% of intervention sessions, 20% of generalization sessions). Interobserver agreement was calculated by using the point by point method with a formula of the number of agreements divided by the number of agreements plus disagreements multiplied by 100 (Tawney & Gast, 1984). Interobserver agreement data indicated 100 % agreement across the experimental sessions for Ercan, 100 % agreement across the experimental sessions for Gaye.

Independent variable reliability (procedural reliability) data were collected to estimate whether the teacher delivered APTP and other experimental sessions (e.g., baseline, generalization, and maintenance sessions) as they were planned in the study. Independent variable reliability was calculated by dividing the number of observed teacher behaviors by the number of planned teacher behaviors, and multiplied by 100 (Billingsley, White, & Munson, 1980). Percentages of the teacher's compliance with the planned steps in all experimental sessions for all participants were consistently high overall. The teacher delivered the sessions with 95 % compliance with Ercan, 93% compliance with Ersin, and 90% compliance with Gaye.

Results

Instructional Data

Figures 1 through 3 depict data collected on the percentages of correct responses during full probe, daily probe and maintenance sessions.

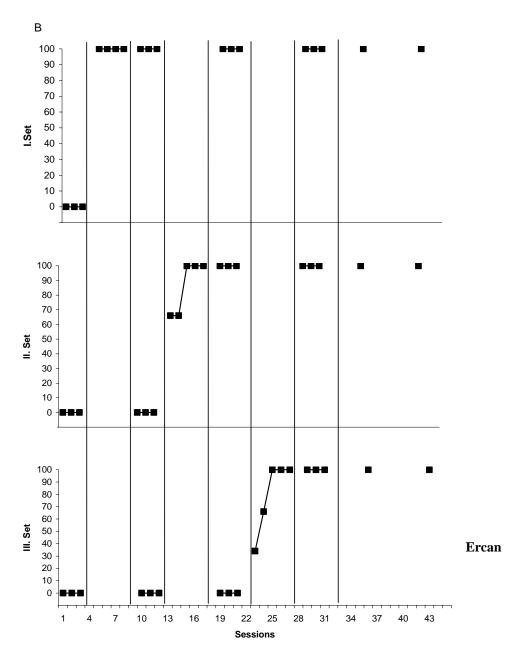


Figure 1. Percentage of correct responses without prompt for the target skills for Ercan during baseline, intervention, and maintenance probe sessions. Data collected during daily probe sessions are plotted for the

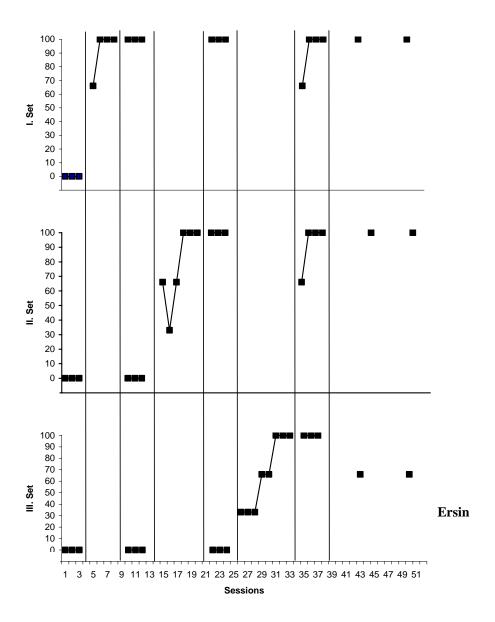


Figure 2. Percentage of correct responses without prompt for the target skills for Ersin during baseline, intervention, and maintenance probe sessions. Data collected during daily probe sessions are plotted for the intervention sessions.

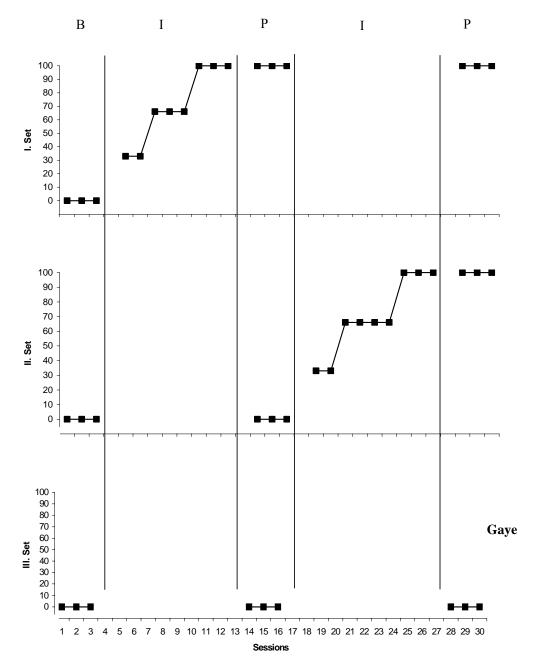


Figure 3. Percentage of correct responses without prompt for the target skills for Gaye during baseline, intervention, and maintenance probe sessions. Data collected during daily probe sessions are plotted for the intervention sessions

Data showed that APTP was effective on teaching emergency phone numbers to three students with developmental disabilities. No procedural modification was needed during study.

The instructional data for each student are prsented in Table 2. Data for instructional efficiency were collected for the number of training sessions, the number of training trials, the number and percentage

of training errors, amount of training and probe time, and the number and percentage of probe errors. As seen in Table 2, a total of 49 training sessions and 147 training trials were required for the students to reach criterion on the emergency phone numbers. Ercan required 14 training sessions and 42 training trials, Ersin needed 18 training sessions and 54 training trials, and Gaye required 17 training sessions and 51 training trials to reach criterion across training sets.

A total of 290 min of training time was required to reach criterion on all three sets for all students. Ercan required 82 min, Ersin required 116 min, and Gaye required approximately 92 min of training time to reach criterion on all training sets. Approximately 35 min of probe time was required to reach criterion for all students. No training errors occurred during training sessions.

The total probe errors across training sets were 12%, 24%, and 33% for Ercan, Ersin, and Gaye respectively. The total probe errors across students was 24%. The number of probe errors across students was 35 out of 147 trails during probe sessions.

Maintenance and Generalization Data

Maintenance data were collected one and three weeks after the final full probe session. Data showed that one student with developmental disabilities (i.e., Ercan) participated in this study maintained the acquired emergency phone numbers at criterion level in two out of the three training sets. He performed with 63% accuracy with his third training set.

Generalization across persons data showed that all students generalized the acquired emergency phone numbers to other teachers to a certain extent. Pretest generalization measures across all training sets for all students showed that the students had no correct responding initially. Individual posttest generalization measures showed that Ercan generalized the acquired skills with 100% accuracy across persons and Ersin generalized the acquired skills with 78% accuracy across persons. No generalization posttest data and maintenance data were collected for Gaye due to subject attrition.

Social Validity

Mothers in the study reported without hesitation that they were very pleased about their children's participation in this study. All mothers indicated that their children have to stay at home alone for certain periods in a day and it is very vital for them to know these numbers when they are in any dangerous situation in order to survive. Furthermore, all mothers reported that they would be happy if their children would participate in similar studies in the future. They especially reported that it is very important for them that their children learn to make emergency phone calls to police department, fire department, emergency room etc., and speak or leave a message when they need to.

Discussion

The purpose of this study was to evaluate the effects of APTP on teaching emergency phone numbers to youth with developmental disabilities. Furthermore, parents' opinions regarding teaching emergency phone numbers to their children were examined in the study. Based on the data collected, several findings are worthy of discussion.

First, data indicated that APTP was effective on teaching emergency phone numbers to youth with developmental disabilities. These findings are consistent with the findings of the previous studies which aimed to teach various diesrete skills (Roman & Pear, 1985; Shapiro & Sheridan, 1985; Singleton et al., 1999; Welch et al., 1985). Limited research was conducted to investigate the effectiveness of APTP on teaching discrete skills to individuals with developmental disabilities. Therefore, it could be argued that the findings of the present study enhance the current literature. Second, the data also indicated that APTP was effective on both maintaining and generalizing the acquired skills. Maintenance data were collected one and three weeks after the termination of the instruction and generalization across persons data were obtained in the study. These findings were also consistent with the findings of the previous studies (Roman & Pear, 1985; Shapiro & Sheridan, 1985; Singleton et al., 1999; Welch et al., 1985).

Third, social validity findings of the study were positive overall. Social validity aspect of the APTP intervention was not examined in the previous studies except Ersoy et al., 2005.

Although the findings of the present study are encouraging, the findings should be interpreted cautiously due to following limitations. First, three subjects with developmental disabilities attended the study and the study was limited by teaching emergency phone numbers. Second, all emergency phone numbers taught in the study consisted of three digit numbers. Therefore, the subjects sometimes experienced some confusion on remembering some numbers. In order to overcome this problem, the mothers were advised to hang a note paper indicating the emergency phone numbers and the pictures symbolizing each emergency situation on the refrigerator and bookcase of the subjects after the termination of instruction. Third, the subjects of the study had mild developmental disabilities. Therefore, the results should be interpreted by considering this population only.

Although there are limitations of the study, the following points should be considered as the positive aspects of the study. First, the instructional procedure, APTP, used in the study let the instructor use two or more prompts at a time when needed. Since there is not a prompt hierarchy in the instructional procedure, a detailed prompt fading strategy was not needed during the study. Therefore, APTP can be considered as a user friendly procedure. Another contribution of this instructional procedure can be interpreted in terms of efficiency. Since APTP does not require a detailed prompt fading strategy, the study was completed in a relatively short period of time. The APTP does not require the instructor have delay intervals between task direction and controlling prompt and this feature also contributed to the efficiency of instruction.

The following future research suggestions can be made when results of the study are taken into consideration. Further research should be conducted to examine similar effects with the students with moderate to severe developmental disabilities with different target behaviors. Moreover, teaching chained skills with APTP can be designed in the future studies. Future research can be conducted to teach speaking on the phone and leaving a message to emergency centers when needed.

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